



# OFFICE OF THE ARMED FORCES MEDICAL EXAMINER



Office of the Armed Forces Medical Examiner  
1413 Research Blvd, Building 102  
Rockville, MD 20850

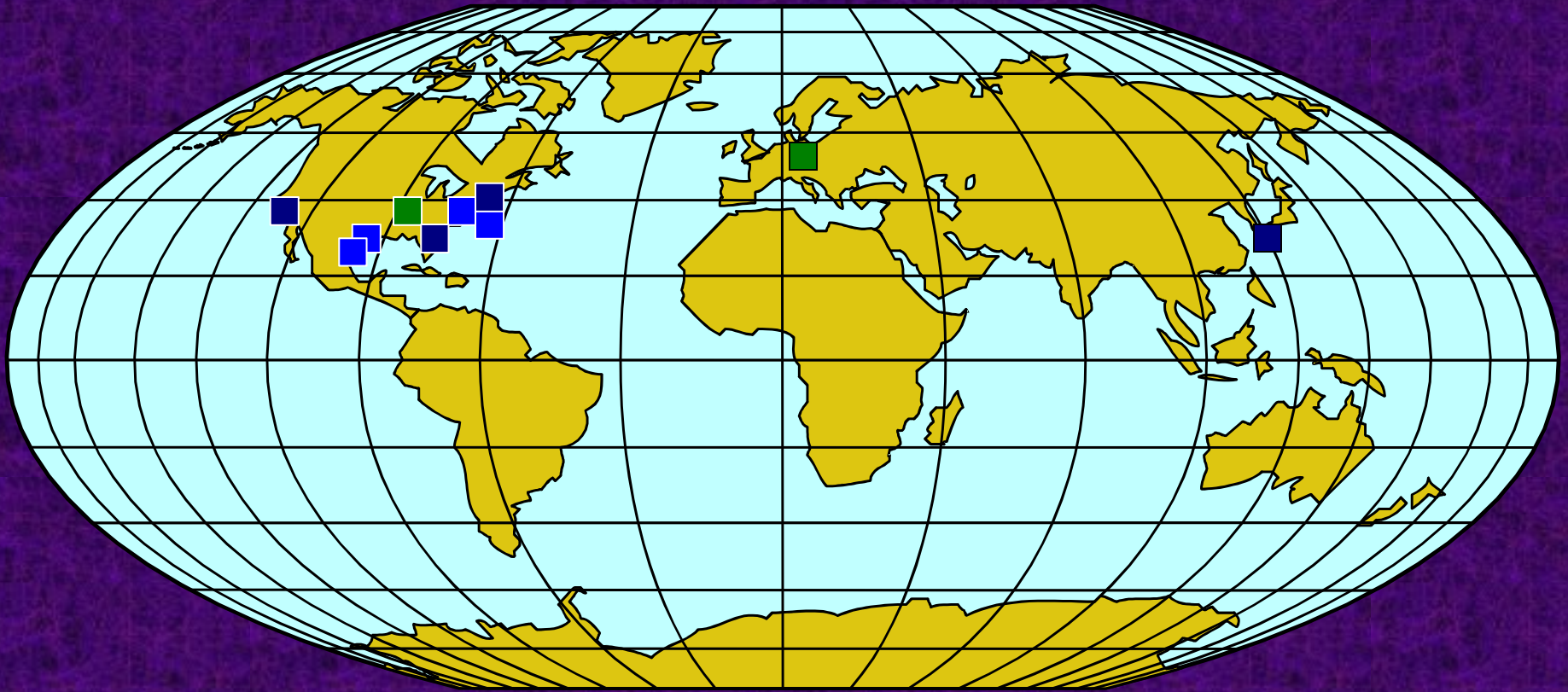


# Office of the Armed Forces Medical Examiner

- 10 USC 1471
  - Grants jurisdiction for cases under Federal Jurisdiction
  - Allows for second investigations
  - Respond to requests for assistance by other Federal agencies



# Armed Forces Medical Examiners



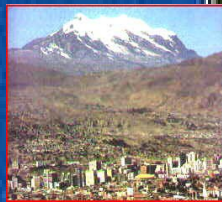
# **Principal Functions**

- **Operational Safety Investigations**
- **Medicolegal Death Investigations**
- **Consultation**
- **Operational Research**
- **DoD-wide Autopsy Quality Assurance**
- **Federal Agency Support**



# Armed Forces Medical Examiner

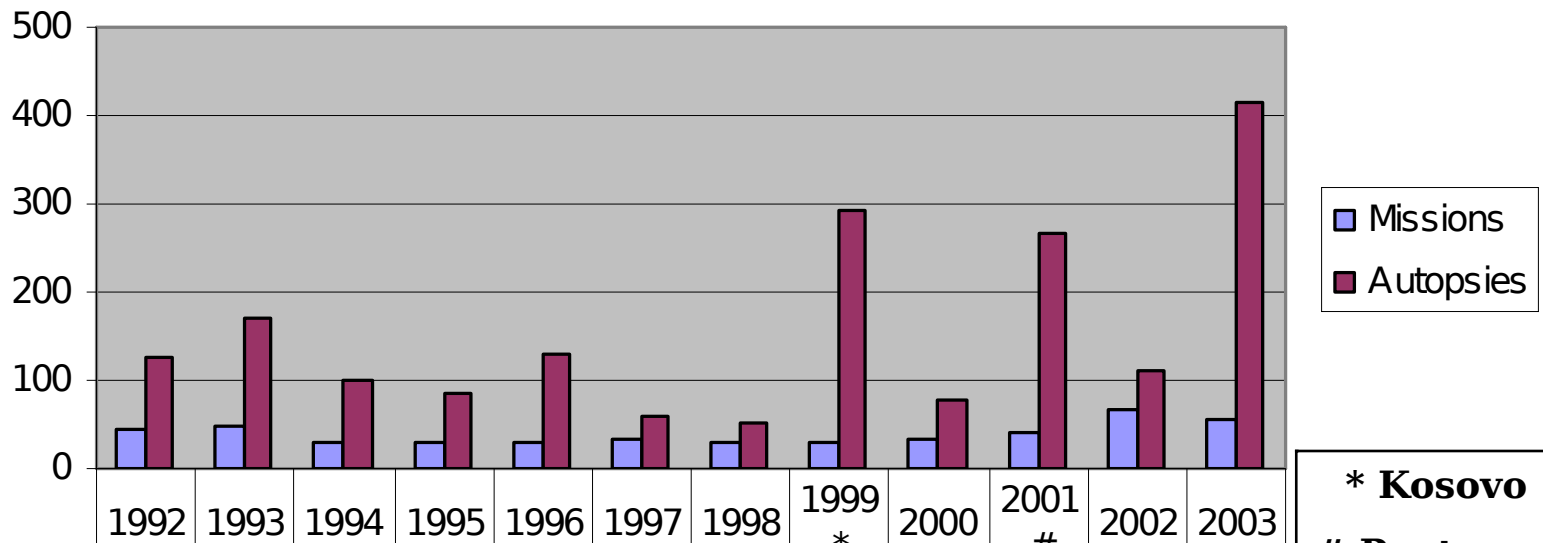
## Operational Activities 2003





# Office of the Armed Forces Medical Examiner

**Missions and Autopsies 1992-2003**



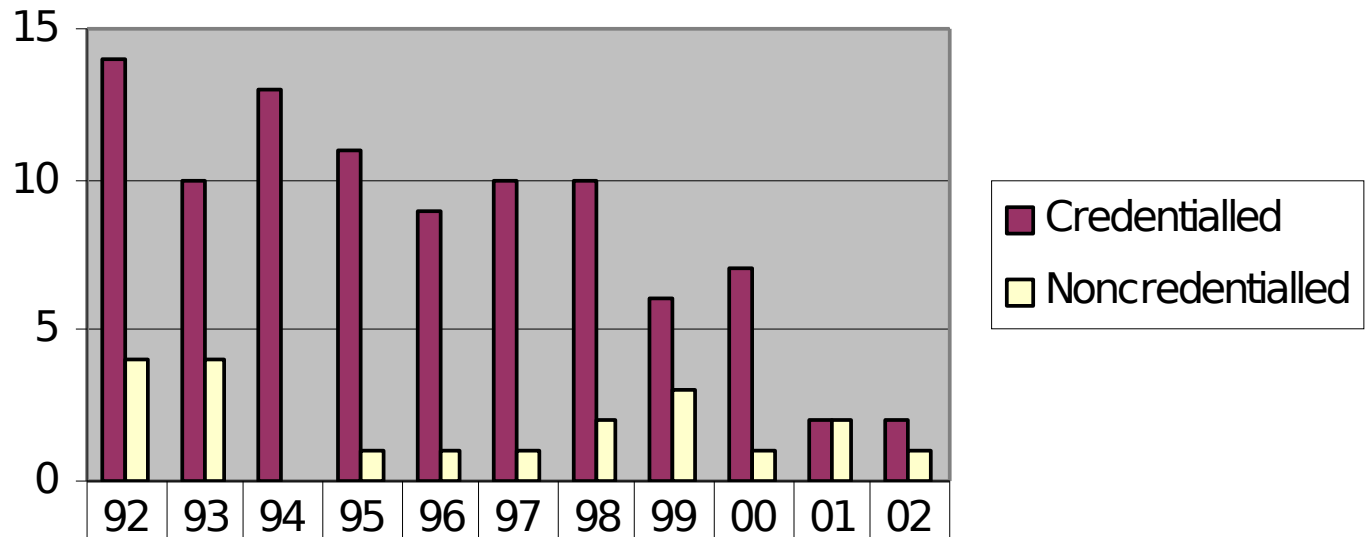
**\* Kosovo  
# Pentagon**

Missions	44	48	28	28	29	33	29	31	33	40	67	55
Autopsies	125	172	99	87	130	61	52	292	78	265	111	413

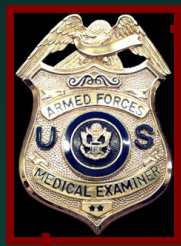


# Office of the Armed Forces Medical Examiner

**OAFME Forensic Pathologist Staff 1992-2002**



Credentialed	14	10	13	11	9	10	10	6	7	2	2
Noncredentialed	4	4	0	1	1	1	2	3	1	2	1



# Mortality Data By Service (OIF)

21 Mar thru 5 Sept 03

**Total      Hostile      Non-Hostile**

<b>Army</b>	*193	114	75
<b>Marines</b>	83	42	40
<b>Navy</b>	*10	3	6
<b>Air Force</b>	5	4	1
<b>Total</b>	*291	163	122

\* Includes 6 pending determination of hostile/non-hostile





# Mortality Data OIF (21 Mar-5 Sept 2003)

	Hostile	Non-Hostile	Total
<b>Weapons/Explosives</b>	135	18	153
<b>MVA</b>	6	39	45
<b>Aviation</b>	6	21	27
<b>Illness</b>	0	11	11
<b>Suicide</b>	0	13	13
<b>Drowning</b> (non MVA, non-AVN)	0	7	7
<b>Other/Pending*</b>	16	13	29
<b>Total</b>	<b>163</b>	<b>122</b>	<b>**291</b>

\* Includes falls, heat, electrocution, overdose, etc, plus "pending" determination of cause



# Exertion Related Deaths: Update to Forensic Investigations

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Armed Forces Medical Examiner  
Armed Forces Institute of Pathology

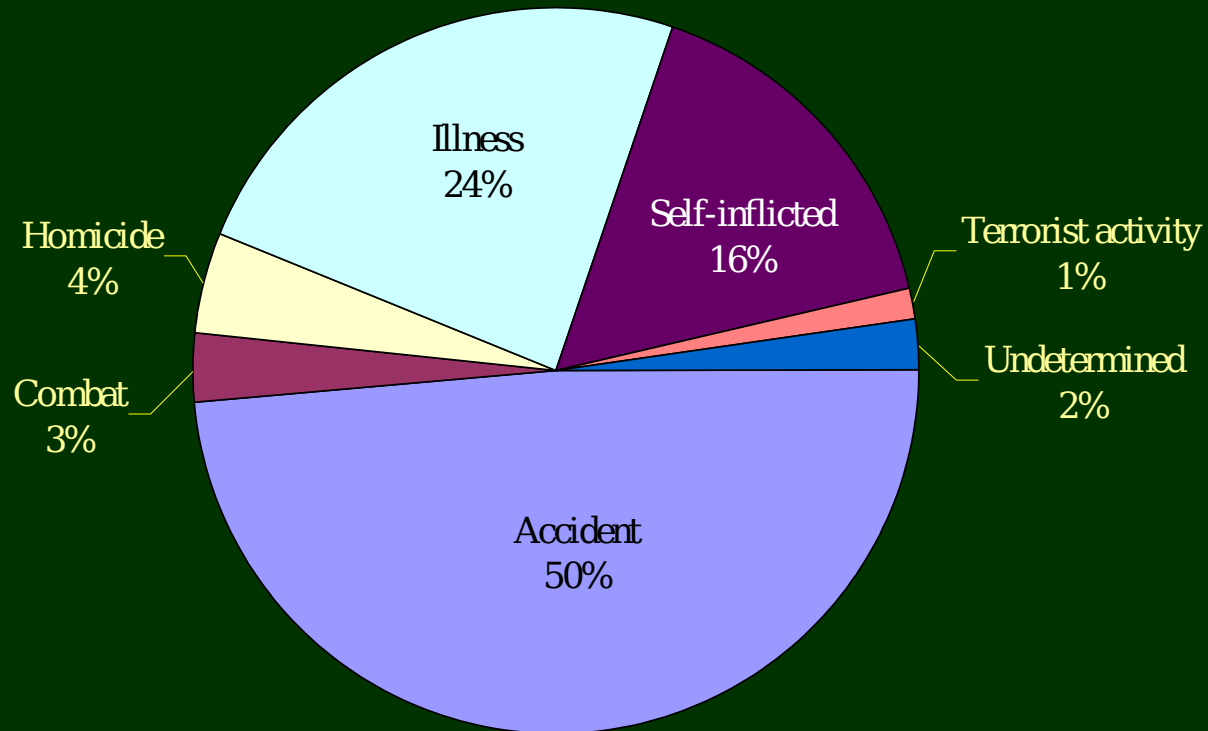


# Mortality Registry: 1998- Current

- Approximately 1000 servicemember deaths/year from 1998-2002
- 2003 at current rate will hit 1400
- Distribution      1998-2002      2003
  - Army 42% 51%
  - Navy 23% 17%
  - Marines 16% 18%
  - Air Force 19% 14%



## Proportion of Deaths by Manner All Services: 1998-7/03





# Mortality Registry

- “Illness” (natural) accounts for approx. 25% of deaths
  - Cardiovascular 45%
  - Neoplasm 30%
  - Neurological (predominately CVA) 5%
  - Infectious 5%
  - Circulatory 4%
- 338/5879 (5.7%) deaths are associated with exercise or other strenuous activity





# Physical Activity (PA) Deaths: 1998-7/03

	1998	1999	2000	2001	2002	2003	Total	%
Army	43	25	33	38	32	19	190	56.2%
AF	5	5	5	8	10	2	35	10.4%
USMC	7	9	9	5	11	4	45	13.3%
Navy	17	11	9	9	17	5	68	20.1%
Total	72	50	56	60	75	30	338	

**Average Age = 34.3**

**33/338 (9.8%) of activity deaths were in recruits**



## PA Deaths by Activity: 1998-July, 2003

Activity	Number	Percent
Unit PT	96	28.4%
Individual PT	68	20.1%
PT testing	60	17.8%
Recreational	72	21.3%
Training/Marching	26	7.7%
PT, NOS	6	1.8%
<u>Other</u>	<u>10</u>	<u>2.9%</u>
Total	338	100%



# PA Casualty Demographics

- Physical Activity casualties are:
  - Predominantly male and Caucasian
  - Predominantly members of the regular component
  - Sickle cell trait identified in 5% of all cases (Range 0-10%) (15 Army, 1 Navy,

	1998	1999	2000	2001	2002	2003
Male (%)	98.6	96.0	94.6	95.0	94.3	100.0
Caucasian (%)	65.3	74.0	41.1	50.0	62.9	50.0
African American (%)	20.8	22.0	48.2	33.3	31.4	23.3
Reg. Component (%)	76.4	68.0	71.4	65.0	67.1	70.0
Sickle Cell Cases	0	2	6	2	7	0



# SCT Positive PA Deaths

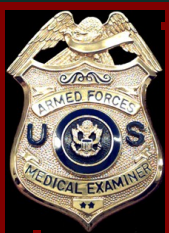
- 17 identified between 1998-7/03
- 15/17 in the Army
- 16 race listed as African American or Black, 1 "Other"
- 2/17 were female
- 5 were in recruits (4 Army, 1 USMC)



# Total & Percent of PA Deaths With Evidence of Ephedrine

	1998	1999	2000	2001	2002	2003
Total	1	2	3	7	7	1
Percent	1.4	4.0	5.4	11.7	10.0	3.3





# PA Deaths By Cause Cases & % Ephedrine (n=338)

<b>Cardiovascular</b>		<b>234</b>	<b>Ephedrine (%)</b>
	ASCVD	136	<b>7 (5.1)</b>
	Cardiomyopathy	22	
	Cardiac Arrest, NOS	21	
	Arrhythmia	15	<b>3 (20.0)</b>
	Congenital Defect	11	
	MI	9	
	Cardiomegaly/Hypertrophy	8	<b>2 (25.0)</b>
	Myocarditis	6	
	CV, Other	6	<b>1 (16.7)</b>
<b>Drowning</b>		<b>37</b>	
<b>Heatstroke</b>		<b>23</b>	<b>2 (8.7)</b>
<b>CVA</b>		<b>12</b>	<b>4 (33.3)</b>
<b>Hemorrhage</b>		<b>5</b>	
<b>Respiratory</b>		<b>3</b>	
<b>Other</b>		<b>24</b>	<b>2 (8.3)</b>



# Distribution of Identified Ephedrine Use in Fatalities

Total Cases: 54

## Service

Year	Tot	Army	28
1998	2	Marines	8
1999	5	Navy	10
2000	11	Air Force	8

2001	15
2002	18
2003	3

## Race/Ethnicity

Caucasian	30
African/American	18
Other	5



# Changes to Investigation Protocols

- Issue: Incomplete and inadequate (for medical purposes) investigations on physical activity deaths
- Actions:
  - Discussions with both CID and NCIS
  - Guidelines established and checklists being made for the investigators
  - Improved sharing of investigation results



# Standardization of autopsies

- Issue: There is no Standard of Care in forensics
  - Coroners need not be physicians
  - Sudden cardiac death often viewed as “stuff happens”, minimal to no autopsy
- Actions:
  - Improved visibility of deaths (MSD)
  - Internal practice guidelines for the AFMES
  - Guidance to external agencies (e.g. local authorities)
  - Increased willingness to travel to perform autopsies



# What Still Needs Doing- Policy

- Consider changes to Safety DODI with support from OSD(HA)
  - Currently investigating only those cases that die within one hour of activity, and only those that occur on duty and on base
- Engage Air Force Investigators (OSI)